Education, Training & Operation

From the Traditional Archivist to the Information Manager

AIIM Industry White Paper on Records, Document and Enterprise Content Management for the Public Sector

First Edition 2002
ISBN 3-936534-00-4 (Industry White Papers Series)
ISBN 3-936534-07-1 (Industry White Paper 6)

Price (excl. VAT): 10 €

Die Deutsche Bibliothek – CIP-Einheitsaufnahme

Printed in United Kingdom by Stephens & George Print Group

Education, Training & Operation

From the Traditional Archivist to
the Information Manager

AIIM Industry White Paper on Records,
Document and Enterprise Content Management
for the Public Sector

AIIM International Europe
Chappell House
The Green, Datchet
Berkshire SL3 9EH - UK
Tel: +44 (0)1753 592 769
Fax: +44 (0)1753 592 770
europeinfo@aiim.org

DLM-Forum
Electronic Records
Scientific Committee Secretariat
European Commission SG.B.3
Office JECL 3/36, Rue de la Loi 200, B-1049 Brussels - Belgium
Tel. +32 (0) 2 299 59 00 / +32 (0)2 295 67 21 / +32 (0)2 295 50 57
Fax +32 (0) 2 296 10 95
A/e: dlm-forum@cec.eu.int

Authors

TRW Systems Europe
Wolfgang Sommerer
Seidengasse 33/35 - Top 13
A - 1070 Vienna - Austria
Tel : + 43 (0)1 522 70 27 0
Wolfgang.Sommerer@trw.at

UCL University College
London
Elizabeth Danbury
Gower Street
London WC1E 6BT - UK
Tel: +44 (0)20 7679 7204
uczceda@ucl.ac.uk

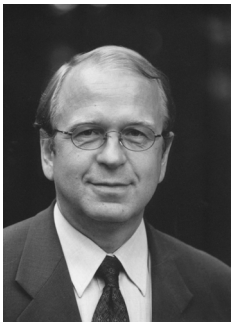
comunicando spa
michele boccaccio
corso italia, 172 95100
Catania - Italia
Tel.: +39 (0)932 803613
servizi@comunicandospa.com

Executive editors and coordinators
Dr. Ulrich Kampffmeyer
Silvia Kunze-Kirschner
PCI PROJECT CONSULT International Ltd.
Knyvett House, The Causeway
Staines, Middlesex TW18 3BA - UK
Tel.: +44 (0)1784 895 032
info@project-consult.com

Published by PROJECT CONSULT, Hamburg, 2002

Industry White Papers on Records, Document and Enterprise Content Management	Series	ISBN 3-936534-00-4
(1) Capture, Indexing & Auto-Categorization		ISBN 3-936534-01-2
(2) Conversion & Document Formats	HP	ISBN 3-936534-02-0
(3) Content Management	FileNET	ISBN 3-936534-03-9
(4) Access & Protection	IBM	ISBN 3-936534-04-7
(5) Availability & Preservation	Kodak	ISBN 3-936534-05-5
(6) Education, Training & Operation	TRW/ UCL/ comunicando	ISBN 3-936534-07-1

Preface



The Information Society impacts in many different ways on the European citizen, the most visible being the provision of access to information services and applications using new digital technologies. Economic competitiveness of Europe's technology companies and the creation of new knowledge-rich job opportunities are key to the emergence of a true European digital economy. Equally, the Information Society must reinforce the core values of Europe's social and cultural heritage – supporting equality of access, social inclusion and cultural diversity. One important element in ensuring a sound balance between these economic and social imperatives is co-operation between the information and communication industries and public institutions and administrations. Over the past 5 years, the European Commission in co-operation with EU Member States, has worked to create a multi-disciplinary platform for co-operation between technology providers and public institutions and administrations. The Forum aims at to make public administration more transparent, to better inform the citizen and to retain the collective memory of the Information Society. These objectives are at the heart of the eEurope Action Plan adopted by the European Summit in Feira on June 2000. I welcome the way the DLM-Forum has evolved over this period as a platform for identifying and promotion concrete solutions to many of the problems facing our public administrations.

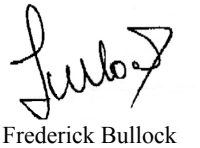
In 1996 the initial focus of the DLM-Forum was on the guidelines for best practices for using electronic information and on dealing with machine-readable data and electronic documentation. More recently, at the last DLM-Forum in Brussels in 1999 a challenge was made to the ICT industries to assist public administrations in the EU Member States by providing proven and practical solutions in the field of electronic document and content management. The importance of providing public access and long term preservation of electronic information is seen as a crucial requirement to preserve the "Memory of the Information Society" as well as improving business processes for more effective government. Solutions need to be developed that are, on the one hand, capable of adapting to rapid technological advances, while on the other hand guaranteeing both short and long term accessibility and the intelligent retrieval of the knowledge stored in document management and archival systems. Furthermore, training and educational programmes on understanding the technologies and standards used, as well as the identification of best practice examples, need to be addressed. I welcome the positive response from the ICT industries to these challenges and their active involvement in the future of the DLM-Forum, for example in the event proposed in Barcelona in May 2002, to coincide with the EU Spanish Presidency.

The information contained in the following pages is one of a series of six ICT Industry White Papers produced by leading industry suppliers, covering the critical areas that need to be addressed to achieve more effective electronic document, records and content management. I am sure that the reader will find this information both relevant and valuable, both as a professional and as a European citizen.

Erkki Liikanen
Member of the Commission for Enterprise and Information Society

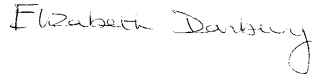
Preface Sponsors

The knowledge economy puts individuals, corporations and organisations in front of a huge paradigm shift. Globalisation and increasing pace are the fundamental traits of most organisations: the entire world is in real-time by reach.
The information society is becoming more and more dependent on the right competencies and the capability to rapidly adapt to needs and to acquire new knowledge.
The challenge for corporations, organisations and individuals is to continuously keep, maintain and update their skills. The new learning environments, presented in our White Paper, address those challenges.



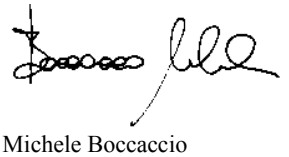
Frederick Bullock
Vice President & General Manager for UK Operations
TRW Systems

Education and training in an electronic world are challenges faced by universities and institutions of higher education.
New pedagogic methods and the new possibilities for continuing professional development and lifelong learning are under development.
What are e-Learning requirements of the digital economy, what are the potential benefits of e-Learning? This White Paper will describe also what businesses and corporate institutions in the 21st century must have and implement - a learning and training vision.



Elizabeth Danbury
Director of International Projects and Research. Programme
UCL School of Library, Archive and Information Studies

The knowledge economy puts individuals, corporations and organizations in front of a huge paradigm shift. Globalisation and immediacy are the fundamental traits of most organizations operations and people daily activities.
e-learning is the use of information technology and the Internet to manage, design, select, support and deliver all kinds of learning.
People being constantly on the move, learning also goes mobile. m-learning develops from the combination of e-learning with mobile devices such as personal digital assistant and smart cellular phones.



Michele Boccaccio
Chief Executive Officer
comunicando societa' per azioni

Table of Content

1. Introduction

The information society is becoming more and more dependent on the right competencies and the capability to rapidly adapt to needs and to acquire new knowledge.

Corporation competitiveness in the digital economy relies on the ubiquitous sharing and transfer of knowledge among professionals cooperating in project teams spread across the globe across the extended enterprise, therefore including business partners.

Individual's chances on the labour market also rely mainly on the rapidity to acquire essential fast evolving knowledge.

The challenge for corporations, organisations and individuals is to continuously keep, maintain and update their skills.

The European Union goal to create the most competitive economic area is tightly dependant on increasing the skill level of the work force, and bridging the digital divide. Individuals are also looking at lifelong learning, be it for professional or personal reasons, and seek more and more education and training material on the Web.

These needs can be answered better than ever with the advent of technology enabled learning, based on the Internet and generally coined e-Learning.

In this White Paper, we:

- Look at the management of electronic archives.
- Analyse education and training requirements in the digital world, looking at the drivers to e-Learning and the learning gap.
- Consider the challenges faced by universities, some of the new pedagogic methods under development and the new possibilities for continuing professional development and lifelong learning.
- Outline the different business models
- Illustrate them with examples of best practice
- Argue that businesses and institutions in the 21st century must have and implement a learning and training vision.

It is our aim that this paper will serve as a catalyst for creating a vision in organisations, public and private, on how knowledge is to be created, shared, maintained, transferred, and will help you implement the first steps of your e-Learning strategy.

John Mancini
AIIM International

2. Archivists and Information Managers

2.1 Organisational and social trends and electronic record keeping

Records reflect the organisations and processes, which created them. Hence: "changes in organisational structures, processes and communications shape the purpose, content, provenance and uses of electronic records".

The global nature of trade, competition and telecommunications has resulted in huge changes to commercial and government enterprises:

- Organisational hierarchy has been flattened: middle management, in particular, has been cut down in size and more responsibility has been delegated to individuals and teams;
- Components of the work and business process have been outsourced or privatised.

Many of these structural changes depend upon advanced information systems, which provide up-to-the-minute, full and accurate information, shared knowledge and fast communications.

Users need and expect immediate access to electronic sources for their work, welfare and leisure activities. Government policies on social inclusion, education, citizens' rights, accountability and transparency depend on and, to some extent, have been stimulated by the information revolution.

In the period between 1880 and 1980 physical communications were changed out of all recognition by mechanical developments such as the internal combustion engine and the jet engine.

The impact of the transport revolution has not merely been felt in such areas as road building and urban development, but in almost every aspect of life, from warfare to medicine and from trade to education.

The impact of the information revolution is likely to be every bit as wide-ranging. It will need an assortment of skills and considerable collaboration between professions to manage electronic records.

Computer specialists, archivists, records managers, documentalists, information managers, preservation managers, conservators: all of these groups have contributions to make to the work of ensuring short-term and long-term access to authentic electronic records.

2.2 International developments and management of electronic records

The E-world economic agenda, as for example summarised by the British Prime Minister, Tony Blair, is: "there is no new economy. There is only one economy, all of it being transformed by information technology. What is happening is no dot com fad, which will come and go – it is a profound economic revolution".

Administrations in Europe, the Americas, Australasia and elsewhere are making plans to have services available online electronically and to ensure that records produced by or for the state are electronically stored and retrieved by the end of 2010 or even earlier.

The motivation behind this drive is the aim to improve business effectiveness by fast creation, organisation and retrieval of information. However, in order to achieve this, public services, industry, universities, and charities - all organisations will require proper E-record keeping. It will not be possible to keep everything, or else we shall be overwhelmed by tidal wave after tidal wave of unmanageable information.

On the other hand, in order to ensure transparency of business and other activities, those records, which provide the evidence for the activities of individuals, communities and organisations must be retained. It will be necessary to ensure the reliability and authenticity of electronic records.

Policies for the management of electronic records will have to be tailored to the management requirements of each individual organisation.

Responsibility for decisions on retention, destruction and accessibility of electronic records must be clearly assigned to line management.

A variety of specialists (information managers, computer technologists, preservation and conservation managers) will need to contribute to considerations of systems design, technology assessment, short-term access and long-term access to electronic records.

In order to manage the electronic records of the future, barriers between many of those managing them will have to be broken down.

The E-TERM project (European Training in Electronic Records Management), linking universities, practitioners and businesses in the Netherlands, Germany, Finland, UK, Portugal and Italy, was started to develop a training programme in this essential subject for archivists, records managers and industrial managers.

Other barriers are already being broken down by new ways of teaching, which are being developed in the electronic age.

3. Managing Digital Archives

3.1 The value of content

Managing content is already a fundamental issue, but it will acquire a greater meaning as a key element in managing the knowledge both in complex and simpler organisations. Information only has a value of its own if it is used and made accessible.

3.2 Digital archives and record systems

The successful management of digital archives and records systems in the twenty-first century is a matter of crucial importance for all of us. “There is every indication that reliance on digital information will increase in virtually every segment of society but especially in entertainment, telecommunications, businesses, and government”.

But it is not only their informational value, which gives digital records their significance. Digital records, like paper, film, audiotape or parchment records or records stored on any other medium, provide evidence for the activities and conduct of individuals, institutions and governments.

They also disseminate knowledge about personal and collective expertise, work and achievements. They form a critical resource, which has to be managed in order to be an asset, rather than a liability.

The international importance of the management of digital archives and records is recognised by UNESCO, which has recently commissioned discussion papers, to be published later in 2002, on the preservation of digital heritage and the digitalisation of visual, written and other information resources.

In the past few years, political, legal and scholarly concentration has centred on issues surrounding access to information. Huge numbers of websites and electronic record sources have been created, and much research has been devoted to the development of search engines and other information retrieval mechanisms.

In addition, national governments and international bodies have passed Data Protection and Freedom of Information acts.

This legislation has made the delivery of information to the citizen and the protection of the citizen from the inappropriate exploitation of personal and private information into central issues of public policy.

Legislators have also stressed that this information legislation is designed to encourage more openness as a means of building trust between government and regional communities.

There has been great emphasis on social inclusions: enabling people, who may face sensory, physical, intellectual or attitudinal barriers, to have full access to heritage, social, legal and other resources.

Access to information is said to "empower" citizens and give them better career opportunities, a finer appreciation of their rights and a greater understanding of the world around them.

Many schools and universities now deliver courses designed to promote students' awareness of electronic information sources and to enable them to manage and use information sources effectively in their reports and essays.

Of course, creating a digital record can be relatively simple: it is done every time one sends an e-mail.

But managing electronic records is a complex issue: such work incorporates issues of authenticity, accountability, reliability, preservation, access, organisation, technology, law and finance.

Many organisations now use digital means of communication: such organisations need to be much more alert to issues of data management throughout the life cycle of records than they have previously been, if they are to protect their own interests and those of their clients, customers or users.

There have been several major handbooks written in the past few years to aid organisations managing both paper-based and electronic records and archives: the subject is so important that UNESCO's decision to commission additional papers is not surprising.

It is a truism to say that the technological environment is continuously changing. The rate of this change is so fast that it is not likely that one " final solution" for certain aspects of electronic records management, particularly for long-term preservation, is likely to be found – at least in the foreseeable future.

Consequently, it will be necessary for managers to adopt clear but flexible strategies: some rules will, as time goes on, require modification and other rules will need replacing. Managers will have to keep constantly up-to-date with international, national and academic developments, publications and websites.

3.3 On-line education and training

Courses and facilities are now available for schools, universities, vocational training, occupational training and adult education and lifelong learning.
Universities across the world are developing digital campuses and offer web-based distance learning.

The services offered by a "virtual university" are likely to include:

- Electronic registration and admissions;
- Electronic learning, mentoring and counselling;
- Electronic advisory services;
- A digital library and an electronic bookshop;
- Electronic student activities (including a chat room);
- Electronic assessment of student learning

The virtual university will run parallel to and be linked with the physical university: electronic learning will supplement, and sometimes replace face-to-face courses.

The courses can be taught by various means, but these almost invariably will include web-based instruction (WBI), which involves

- delivering course material
- administering tutorials and exercises, and
- tutor communication with students.

Many universities are now designing and testing their own WBI systems, though some prefer to buy them ready-made from software manufacturers.

Once registered, students log on to the course home page. They use email, newsgroup or life "chat" functions to communicate with each other and with the tutors and lecturers.

Students will usually take online tutorials, which provide immediate feedback, and timed exercises (or "quizzes"), which are marked online. They can take advantage of on-line reference facilities provided by the universities.

Lecturers are able to update class material and circulate information as necessary and can also provide tests and tutorials on the web.

The software makes it possible to track the progress of the students.

3.4 Challenges of e-Learning for universities and students

There is a great temptation to rush into E-learning. It is a vital new development, and some are apt to see it as the answer to all teaching and learning problems.

It is not.

- E-learning is not suitable for all subjects. One can, for example, learn a great deal about human anatomy, physiology and of the theory of surgery online. However, few people would care to undergo an operation, when the surgeon only knew "in theory" how to conduct it.

- It is not a cheap option. In order to be successful, e-Learning and teaching must be done well, and have full support facilities. It is not surprising that many of the most successful courses are provided by institutions, which have thought through all the financial and other implications of developing the technical infrastructure, and intellectual framework, which will be required by students.
  One obvious example of success is the Open University in the UK, which now provides online and distance courses available worldwide. It provides an excellent online library, and has considered copyright issues and the costs of paying for access to such essential items as E-journals.
  It is also interesting to note that three major universities: Oxford (UK), Stanford and Yale (USA) have, in the past year, joined forces to provide new courses in lifelong learning.
  Courses available include options on economics, film studies, humanities, music, politics, psychology and technology. The intellectual and technical infrastructures of these large and distinguished universities support the courses: this kind of collaboration may well be one way forward for e-Learning.
- e-Learning demands a competent and elaborate administrative infrastructure. It is, undoubtedly, more complex to organise than courses for on-site students.
- e-Learning is not suitable for all students. Although an ever-increasing number of people have access to computers, this access is by no means universal. Even when an employer supports e-Learning, it has been found that not all potential students have on-line access at work. This makes E-based academic progress difficult to achieve. Further, not everyone can use a computer or wishes to do so. There should be no question of forcing computer use on an unwilling student.
- e-Learning is not suitable for all professors and lecturers. Some do not wish to use this means of teaching: all who wish to do so will have to learn new skills. In addition to a full understanding of the learners' goals and needs, command of the course requirements and, of course, of the subject matter being taught, it is an advantage if tutors have:

  - Some familiarity with hypertext markup language (HTML) and extensible markup language (XML);
  - Some familiarity with the creation, editing and saving of files and the ways of transferring them to a website;
  - Some familiarity with the specialist file formats used in audio, video and other files;
  - Awareness of good design in teaching formats;
  - Knowledge of the variety of learning environments, intellectual infrastructures and technical frameworks on which the course will be built;
  - Awareness of the possibilities of new technologies as teaching tools;
  - Ability and willingness to use technologies appropriate to the learners, their needs and the course objectives;
  - Willingness to interact continually with the students, to provide feedback to them and to re-evaluate methods of delivery as appropriate.

This last is critical. Lecturers and tutors are likely to have to give a great deal of time to e-Learning. The number of emails received from and sent to them are very great.

Many tutors talk of receiving 500 emails a week from their students, most of which need replies.

To be available twenty-four hours a day and seven days a week may be heralded by some enthusiasts as a wonderful new development, but it presents problems even to the most dedicated of lecturers.

In addition to providing student support online, they also have a great deal of work "behind the scenes":

- liasing with library, computer, design, academic and administrative colleagues
- developing new courses
- marking coursework
- evaluating course content and delivery
- developing assessment criteria
- planning for the future

However, in spite of the facts that it is not a simple or cheap solution to problems in education and training, e-Learning has an exciting and important contribution to make:

- It can underpin national and international policies and developments.
- It can support citizens' rights and challenge social exclusion, whether this is caused by environmental factors (difficult physical access, rural isolation, poor transport links), personal and social factors (poverty, low self-esteem, disability, prejudice of all sorts) or institutional factors.
- Education and training online can support and promote the work of organisations, businesses and industries of all sizes.

In a rapidly-changing world it will help individuals

- to update their skills and knowledge
- to foster professional development and business opportunities and
- to help break down boundaries

– whether these are geographical, political, regional, national, cultural or institutional.

The rewards for everyone participating and contributing to successful e-Learning projects will more than justify the energy, commitment and sheer hard work, which such projects demand.

3.5 Content creation and access

Products available on the market to support electronic content design, development and creation are called Authoring Tools.

3.5.1 Authoring tools

They are multimedia creation tools and are used to develop content for all the content delivery systems by a multimedia professional to create media that can either stand-alone or be added as a module into a management system.

Many projections indicate that in the years to come authoring tools will be built into the delivery systems, so the need to choose different system to create and manage content as well as to deliver it will cease to exist.

The authoring tools provide templates and storyboarding capabilities, and may be used to convert existing content. A merging of LMS and authoring systems may be where the market is heading, but a separation of content generation and delivery capabilities from administration tasks may currently be what is best for developing e-learning efforts.

3.5.2 Standards for content creation and types of learning objects

As mentioned earlier standards are now gaining a great meaning in the field of content creation or content digitising. As developing and owing content which is standard compliant is the only way to ensure that content can be shared across organisation and across units of the same organisation, can be integrated everywhere across delivery systems and can be easily reused.

So success of content creation and management depends very much on development of learning objects, which are reusable, media-independent chunks of information organised by a meta-data classification system.

Learning objects are the modular building blocks of e-learning content, and can include such media types as text, graphics, audio, video, animation, games, tests, and simulations.

Many documents in the E-learning literacy refer to Lego™ blocks as an example of what plug-and-play modularity and reusability to build up different outcomes means.

3.5.3 Content requirements

Content has to be developed

- to capture, stimulate the learner attention and concentration as well as
- to fit into the learner self paced learning process.

Content should

- stimulate thought, sound and touch in many innovative ways, with videos, flashes, etc. (multisensory);
- it must challenge the student attention and require his/her actions and contribution, with questions, pop-up windows, etc. (interactive);
- it must be easy to be translated form different languages and moved across culture (transferable);
- it must be easy to stop and easily start again, with bookmarks, control panel, etc. (interruptible); it must be movable everywhere (portable).

Content can be either purchased by external vendors (off the shelf courses), which are specialised in producing course catalogue as their own product for the market or content can be developed based on own content own knowledge (custom content). In this latter case the organisation may decide to develop it in house or get support from content packaging companies.

In fact in many cases corporations have content, such as Word files, PowerPoint presentations, paper documentations, old documents spread throughout many departments: e-content packaging for further e-Learning delivery is he first step to approach knowledge management organisational mind set.

4. Education and Training Requirements in the digital world

In this chapter we analyse the market drivers, which are pushing and sustaining the E-learning requirements in the fast changing set of the digital economy. We briefly discuss the learning gap and its current demand and supply so as to highlight the need of good learning solutions offering to face the challenging economic and competency-based scenario if the next closest years. Finally, we draw an overview on current development trends in technological arena as well as in industry standards of education and learning segment.

4.1 Drivers to e-Learning

The business scenario for the market of training and learning is a very attractive one and it is very much supported in its growth by the digital economy. It represents, in fact, one of the most promising market segments in the world of the Net and of the Knowledge Economy.

4.1.1 Paradigm shift

The knowledge economy puts individuals and corporations and organisations in front of a huge paradigm shift. Globalisation and immediacy are the fundamental traits of most companies operations and human being daily activities: the entire world is in real-time by reach. Information and content are of outmost importance, they get digitised (shift from analogue to digital), multimedia approaches support the distribution of knowledge and this very precious content has to be managed to become a real asset.

4.1.2 Convergence

The convergence of communication, computing and content is as well transforming our lives as employees and individuals too: new media, broader richness more info in compressed chunks and transferred everywhere via telecommunications highways.

4.1.3 Knowledge economy

The knowledge economy is an innovation-based economy, creativity, imagination, competence and new ways of doing things are key elements to support any kind of organisation competitive advantages as well as the key assets for individuals to exploit all the opportunities made possible by the technological growth. So education, training and learning are becoming critical processes to ensure a successful and sustainable growth for communities, social life as well as economy.

Jobs requiring information management capabilities will grow; people will be more and more continuously dealing with information, content and knowledge. Learning will become an integrated aspect of life for individuals and of work for employees and workforce in general.

On-the-job training will become more relevant as learning is deeply embedded in daily work tasks. Educational, academic and vocational programs should focus on effective communication, problem solving, and analytical skills as vital mail competences and on teaching how to learn or re-learn, as it will be a highly valued attribute of individuals now and in the future.

4.1.4 Drivers of e-Learning

The Internet has now proven to be one the most powerful commerce, communication, and information medium of all time, a revolution - as many have said already - and this puts the whole discussion into a perspective as the customer base of potential users and customers is continually increasing at very high speed.

Several factors are facilitating this substantial growth. The larger and growing base of installed computers in the home and workplace, more powerful equipment and modems as well as network security, infrastructure, and bandwidth improvements too. Access to internet is nowadays more reliable and cheaper and, finally, the consumer is a new consumer, is educated by usage of the new powerful media, is more and more feeling at easy accepting online activities and commerce, is aware of the purchasing power laying in his/her hands.

Consequently, as shown in the figure, the market segment of education, training and e-Learning is, firstly, influenced by the development of the concept of training itself but definitely very much impacted by the fast technological evolution.

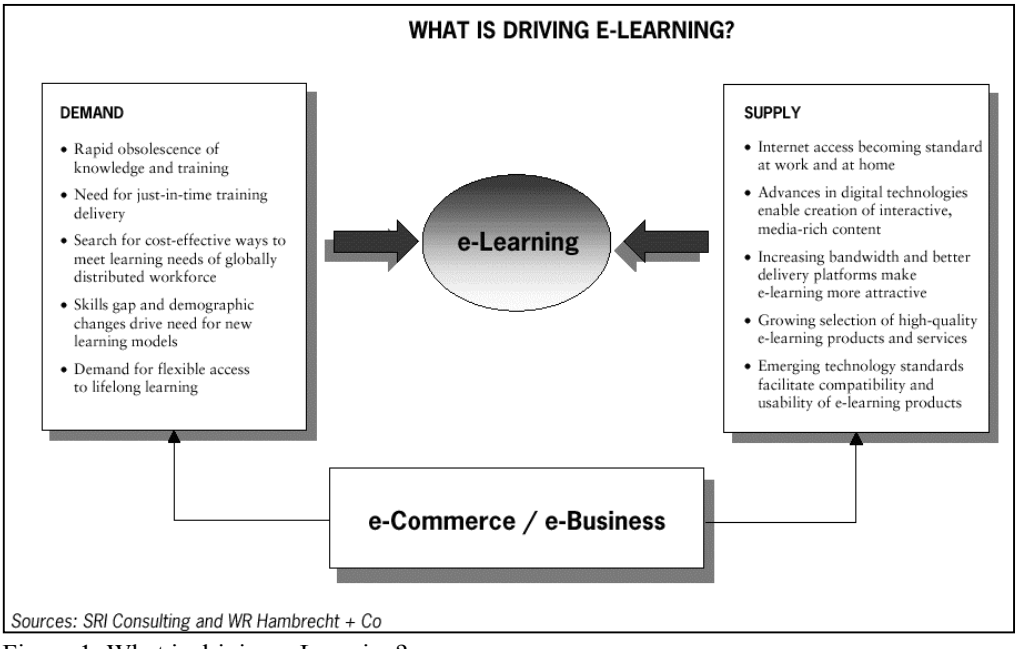


Figure 1: What is driving e-Learning?

Although many of the figures indicated by researchers and market forecast analysis are by now predictions and projections, they are anyway supported by the special focus and attention the international community of professionals an industry is devoting to the field.

Therefore e-Learning is definitely representing a business and a social case. Many other evolution trends in the international training and education market demonstrate that e-Learning, in the wider sense, the natural development for the education industry (corporate or public).

4.2 The learning gap: demand and supply

In Europe by 2010 half of the professional posts demand will be made by companies, which produce products and/or technological services or made by those companies that will make intensive use of technology in their normal business operations. As an example, already now almost 9 millions of European are remote-workers and work form remote or from home. 81 million people out of 117 million of European citizens are less than 25-years old and are still studying by educational institutes and universities. They therefore represent the future generation of the workers and employees of the Net Economy.

The occupation in the world of information society is becoming more and more difficult and very much depending on the right competencies, the rapid capability to adapt to needs and to acquire new knowledge, competence and skills. The challenge for corporations, organisations, professionals and individuals is to continuously keep, maintain and up date their own skills in any competence area.

4.2.1 Lack in competence and skills

The real shift in the market place is that telecomm and information technology is nowadays crossing any kind of industry segment, so the ICT related skills are becoming essential elements to perform any of the job related activities in any business. Lack in competence and skills in the field of Information and Communication Technology (ICT) is demonstrated already by several studies carried out at national and international level in Europe, especially in comparison with USA.

The skill gap is already obvious when looking at the labour market demand of professionals with high qualification and skills in software, Internet, telecommunications and relative services, a demand which is felt unanswered by the current offering. The lack of competencies in the field of Information Technology (IT) could catch up in Europe in 2002 meaningful numbers, up to incapability to fill up approximately 19% of the job needed.

The supply, in order to quickly answer to the described requirements, is currently characterised by various proposals coming from different social parties and corporations of the Italian and European markets and definitely more coming from beyond the ocean (USA).

4.2.2 Initiatives of the European Member States

On the national and international panorama many interventions are nowadays promoted by the European Community and by several government agencies at national level in the state members.

In the European Summit of Lisbon, in 2000, the EU has set a strategic goal of creating a competitive, dynamic and knowledge-based economy, which is reinforced by the European Commission eEurope plan.
Improving basic skills, particularly IT and digital skills is a top priority for the Union, bearing in mind that access to ICTs is for everyone.

EU education and training Programmes, such as Socrates and Leonardo, already make an extensive use of ICT.

Member States' employment policies, in the context of lifelong learning, aim at developing e-Learning for all citizens.

Member States are working to capitalise on the potential of Internet, multimedia and virtual learning environments for a better realisation of lifelong learning to all as a basic educational principle and to develop a digital culture for teachers.

Member States are encouraged to develop high-quality digital learning materials and to provide support mechanisms to facilitate their choice for teachers and to look at the opportunities that digitisation and documentary standardisation offer for increasing the pedagogical use of public cultural resources, such as libraries, museums and archives.
Research in e-Learning is being strengthened in areas such as the improvement of learning performance and evaluation methods.

The EC is implementing an e-Learning Action Plan, and puts emphasis on the exchange of good practice and experiences between Member States as well as Third countries.

New learning environments and approaches take into account the growing differentiation of learners' styles, cultures and languages.

European multilingual educational resources, platforms and services are being stimulated to take into account new distribution methods, the development and promotion of international standards and open source software.

This said, the European industry still considers the European work force as insufficiently skilled, in particular in the field of ICT. This preoccupation was reflected in a letter addressed to the EU Council, meeting in March 2002 in Barcelona.

A specific worry is the lack of ICT training of school professors, often lagging behind their own 10 – 12 years old classes.

4.2.3 E-Learning and the private industries

From the world of the private industry many products and services are offered to the market: a wide range of differentiated proposals in terms of content and distribution channel.

The training offer is shaped in various proposals from traditional classroom training (instructor-led) to e-Learning and Technology Based Learning, form content catalogue (off-the-shelf) to content customised on customer requirements (tailor made). The positioning of the private companies is differentiated: some operate in the development of the training contents; others propose technology to support learning management processes, and finally other deliver to the market range of services to support learning.

The market analyses highlight that operations on the whole three segments (content, technology and services) will be the area where the market will develop and grow at most.

The consulting approach, offering of integrated solutions or stand-alone products and services is nowadays mainly coming form USA based corporations and from big national and multinational companies; however some other recent markets trends also witnesses the development and growth of many small companies, as so to underline the still unsatisfied demand in this industry in terms of quality and volume.

4.3 Technology and standards development

Many are drivers for the digital competitiveness: improved infrastructure (consolidation and wide-spreading of technologies that allow data transmission, sounds, ADSL, satellite broadcasting, GPRS, UMTS, etc.), increased access possibilities (lower entry barriers for on-line services, wider range of services development opportunities), tougher competition, new business models, digital television and Internet TV, faster evolution in communication media market, more and more increasing synergies between entertainment and consumer world, where training and learning develops towards the concept of edutainment.

A lot of other joint factors are then influencing the development of new ways to deliver training ad offering learning opportunities:

- the explosion and wide usage of internet
- extranet and intranet
- the wide diffusion of browsing application and technology
- powerful multimedia personal computers
- desk top and lap top
- wide offering of second-and-a-half and third generation of mobiles phones and personal digital assistants,

- powerful and flexible programming languages as well as
- continually developed standards in the field of documentation and content management as well as in e-Learning field.

4.3.1 Technology

Technology supports the entire learning and training process, from content creation and development to delivery and finally to reporting and evaluation and results assessment. Technology nowadays enables to learning offering in the most effective, flexible and scalable manner.

Technology and standards enables the creation of content, which becomes easy to reuse and update and refreshed. Technology is scalable and is based on open standards to leverage on existing computing and ERP (Enterprise Resource Planning) systems and technological infrastructure as well as supports integration to different and third partied modules and tools and can be empowered to support increase in users into the system.

4.3.2 Standards

Standards are acquiring more and more value in the overall international discussion about knowledge as well as content management. A part of the need of more open standards in the backbone technology and supporting tools on the learning process, standards are now gaining a great meaning in the field of content creation or content digitising. In fact developing and owing content, which is standard compliant, is the only way to ensure that content can be shared across units of the same organisation, can be integrated everywhere across delivery systems and can be easily reused.

The issue nowadays with standards is that they are still under development, not yet widely distributed and there is limit in the understanding on how to use them. Furthermore products need to comply with more than one standard to easily fit almost everywhere, so confusion is somehow hindering the speed of diffusion. Yet, big development steps have been taken in the past recent times. Needs to consolidate and clarify standards usage in the industry is urged by involving content developers, creators and publishers and let them widely understand what to comply with and what standards enable them to do.

4.4 Reflection around systems integration and investments

As at the beginning of this heading “Technologies, tools and methodology in content creation”, we mentioned how important integration of different learning processes is, now it is important to underline how fundamental the integration of the functional tools and systems is to enable effective training and learning delivery as well as knowledge sharing in the organisation.

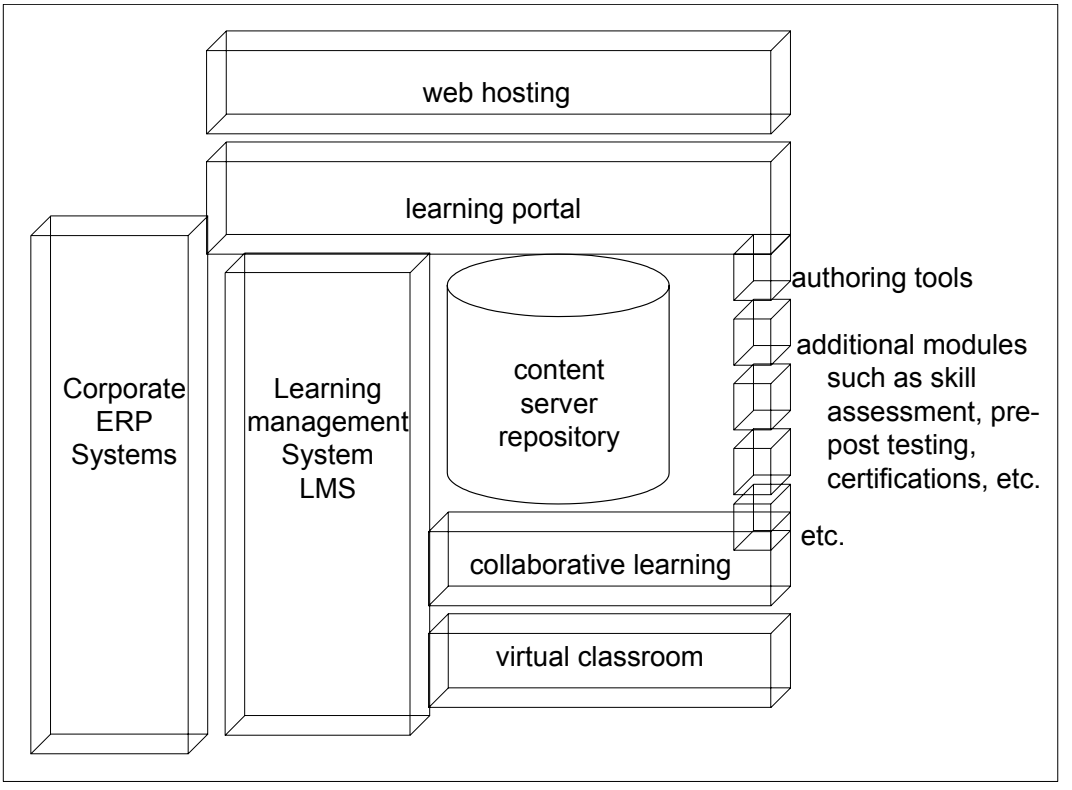


Figure 2: e-Learning infrastructure

4.4.1 Cost/Benefit Analysis

In the choice of e-Learning infrastructure, cost/benefit analysis acquire even more importance than in a normal purchase decision making process, as the value of the investments is of much higher value and it is supposed to last and be gradually up-dated over the next 3 to 5 years.

Costs analysis has to be done comparing the costs the organisation normally spends to design, develop and deliver classroom traditional training against the cost need to set up an e-Learning infrastructure.

So in the fist case, we analyse costs related to facilities usage costs (external rental, internal allocations or overhead) as well as course development and creation costs, then instructors' and learners' costs (subcontracting costs, time away form office, salary of employees during training hours, travelling, allowances, etc.) have to be taken into account. Almost all of these costs have to be calculated for all the training sessions the organisation needs to repeat in order to cover the needed number of target employees.

4.4.2 Investments

On the other side, when establishing an E-Learning platform there are some investments which are spent only once and are spent centrally for the whole organisation. There are some up-grade and maintenance costs, which again are generally spent centrally for the whole organisation.

Learners' costs have to be taken into the calculation as well, however we need to remember that the e-Learning delivery should reduce, by means of effectiveness, the length of training time, up to 20% to 50%, so it is clearly visible the overall benefit in terms of efficiency and effectives.

Also here we need to take content creation costs into account, but here the development cost are carried out only once and many of the cost related to the number of training sessions decrease due to the simultaneous delivery made via internet and the content availability anytime in the net. Travelling costs for instructors and learners also get reduced as ell as facilities costs.

Another view angle that corporations may be willing to take when analysing investment is based on Kirkpatrick/Philips models of evaluation, based on which at level 3 and 4 you measure Job performance and application and Business Results (business impact and improvement in work).

So it means that not only pure cost comparison have to be taken into account when evaluating such strategic expenditure, but the related performance increase that the company may benefit in the short, medium and long term range. Return on Investment analysis is all the time very difficult to be implemented, but it is matter of continuous discussion among experts and professionals.

5. The role of computer based training and e-Learning

In this chapter we depart from the analysis of the concept of Computer Based Training to explore the wider field of e-Learning as it is shaping right now and how mobile learning is currently taking off.

Furthermore focus will be also given to the tools and technology corporations and organisation and learners have at their disposal to manage learning in the digital economy. As well main benefits deriving form e-Learning are discussed and explained.

Finally, an overview of potential users, players or market segment (if seen from business view point) where to address e-Learning significant development trends.

5.1 Computer Based or e-Learning

It is in the past ten years that critical changes have taken place in the learning and teaching environment. Although these changes have mainly affected those in tertiary education, or taking professional development or lifelong learning courses, they have impacted on most learners, including school students.

Boundaries between face-to-face and distance learning are rapidly being eroded. Information for school projects is being downloaded from the internet, as well as being taken from books. Online learning, computer-aided learning and computer-mediated communications are used with older learning technologies such as overhead projectors, video recordings and slide projectors in the classroom or lecture theatre.

Open and distance learning are flexible learning programmes, which can be adapted by learners to suit their individual circumstances. Those who work or have caring responsibilities full or part-time, those who do not (by reasons of distance or disability) have access to a university, those who cannot afford full-time fees – all can benefit from open and distance learning.

It has been suggested that there have been, to date, three generations of distance education:

- Correspondence courses;
- Distance education, using one-way printed material, broadcasting and cassettes, backed up by two-way communication provided by tutors;
- Open courses, based on the use of electronic information systems, including the internet, databases, computer and video-conferencing and much more as it follows.

5.2 The wider arena of e-Learning

e-Learning can be defined as the use of technology and Internet to manage, design, deliver, select, coach, support and share all kinds of learning.

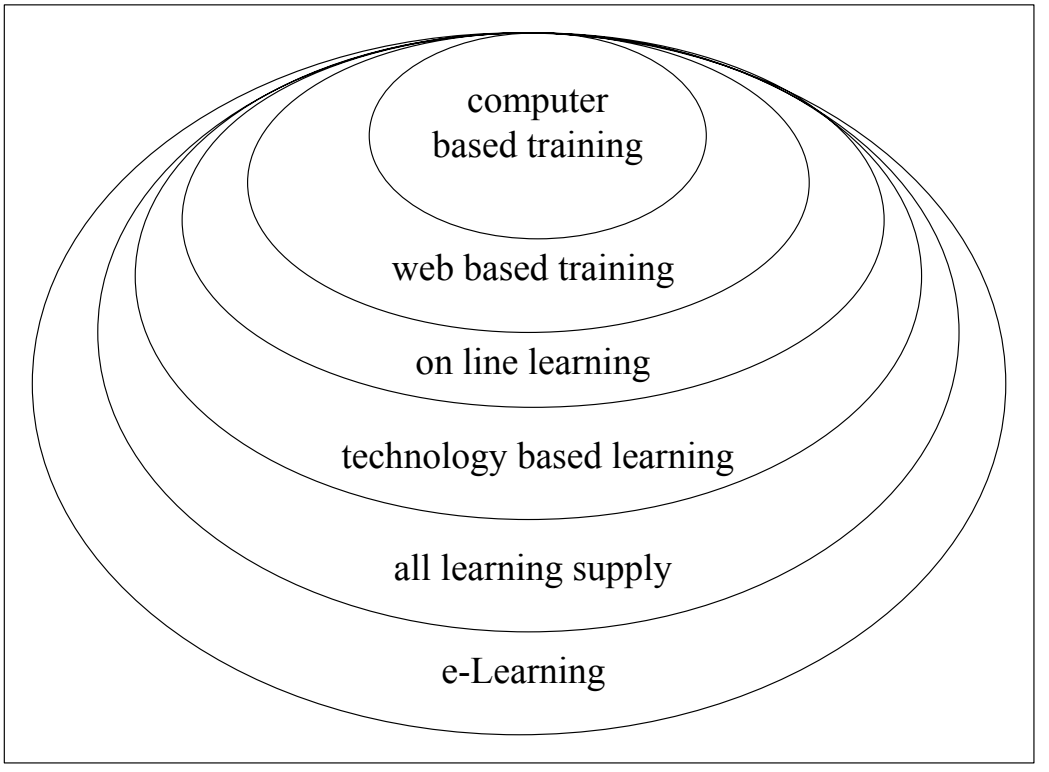


Figure 3: Definition of e-Learning

Its meaning is generally encompassing a big variety of training applications and processes including computer-based learning and CDRom, web-based learning, virtual classrooms, digital collaboration, satellite broadcasting, interactive TV, etc. It is also important to note than in the daily life e-Learning is often used simplistically to refer to on-line learning, e.g. the live experience supported and made more powerful by technology and internet/extranet/intranet. Whereas distance learning is referring to another concept that may or may not involve technology and as such it may comprise delivery methods such as written text and correspondence, as part of old way of delivering training.

As mentioned already, the Internet is the real core issue; in fact, it has transformed the manner education occurs and creates new ways of learning. e-Learning is a sort of result from the combination of internet and education and it should enable a more comprehensive approach to strengthen competence and skills development by providing resources and learning tools/applications to support individual different learning styles.

5.2.1 Learning goes mobile and wireless

Learning not only gets electronically empowered and enabled for wider reach, it also goes mobile and wireless – it is called M-Learning. It develops from the combination of mobile devices (PDAs – personal digital assistant - and cell phones) and e-Learning. This is the ultimate social integration of education/learning and technology.

Cell Phones, PDAs, Mobile Computing and 3rd generation devices – these are equipment and software which enables M-Learning. Mobile devices are converging rapidly into a single handheld device that has all the features of a mobile phone, messaging and computing devices. Large-screen on cell phones with wireless access protocol (WAP) can browse M-Learning text and simple graphics. A monochrome or colour PDA provides more processing power and a much larger screen.

And finally, today's advanced mobile computing with integrated phone capability is the best tool for e-Learning and M-Learning. It provides a full operating system, more memory, and much greater processing power.

Some of the best applications for mobile computers are lecture notes, homework, interactive student chatting, mentoring, and remote access to live computer labs. Mobile devices become even more powerful when combined with wearable components that allow people to perform hand-free complex or manual tasks.

Mobile Learning Era
This is definitely the M-Learning era. The evidence is overwhelming that M-Learning is beginning to take hold; the number of people worldwide using wireless devices is continually increasing as well as the number of people using wireless devices to access to corporate intranets. Furthermore the number of employees who spend up to the majority of their time outside the office is continually increasing and a consistently big part of Internet browsing will be carried out on wireless platforms and the mobile devices used will be more than landline PCs.

Real benefit
M-Learning can result to be a real benefit for individuals and corporations. Remote access possibility becomes an advantage and people can access knowledge bases from almost anywhere. Increase productivity for employees as the workers can engage in e-Learning at any time, while commuting, travelling, or waiting in line, or any other non conventional available time for learning, etc. The field and on-the-job-learning get revaluated from an higher perspective as employees can learn as they perform their tasks, wherever and whenever the information is most useful and can give immediate feed back by generating an input back so that as soon as they learn something new, workers can add to the knowledgebase right from the field. The relatively rapid migration of the enterprise towards mobile technology is being driven by the competitive advantage of the performance improvement and productivity returns made possible by the technology. Many are the examples that can be made of possible and practical applications, however it

is maybe worth to mention M-Learning in heath care industry, or product training for sales forces or for after-sales technical support, etc. Corporations are deploying mobile technology to front-line, point-of-sale personnel to offer performance support, decision support, and productivity tools to employees in the field.

Approaches
As a general overview, M-Learning can be offered mainly in two approaches. The first one offers the access chunks of learning and knowledge downloaded to your PDAs from a PCs and later synched up back to the PC to transfer all data, records and changes and vice versa. The second opportunity is given by the wireless connection, through which you access to content and you perform your learning and training on the move by client-server or client approach. There are several impressive technologies already working in this area.

The technical perspective of Mobile Learning
M-Learning of course drives attention both from technical perspective as well as from content definition, development and from the learning experience that learners have when they are "on the move". In fact, being mobile correlates with highly interrupts and fragmented attention, and the challenge is to better understand what kind of learning could happen in those timeslots. So issues about instructional design and content creation and packaging have to be taken into account, such as rather small modular learning chunks than long storyboards, profiling and interaction much more personalised, etc. On the other side, from technical view point the promise is to make sure that content can be seamlessly accessible from any mobile device and terminal, so that learning nuggets are properly recognised as they are standards compliant (as mentioned earlier on in this paper), can be managed and displayed on PDAs screens, can be delivered by using graphics, videos and voice.
In reality the true challenge will be to combine tree main factors, the learner, the content we need to deliver and the platform as backbone.

5.3 Characteristics and benefits of e-Learning

5.3.1 Benefits for learners

e-Learning is personalised, course can be as any other traditional solutions personalised based on organisations' needs, but the power of e-Learning is deriving from the fact that students can control the path, the pace, the rhythm for their own learning experiences. e-Learning is also Just-in-time and very flexible, as you can access to content exactly the very moment it is needed for learning or for working reasons. Based on the above two issues is even easier to understand that it is learner-centric, as learning, and not the content or the trainer, is at he real centre of the learning process thanks to the control given back to the learner. e-Learning offers anywhere an always up-to-date content, as we said above how easy it is thank to technology and modular learning object approach to up date and maintain knowledge.

5.3.2 Benefits for organisations

e-Learning leverages on internet capabilities to support timely and cost effective communication, as learning in the current century has the following characteristics: it has to be easy, accessible, effective, quick and costs efficient. Organisations benefit from Convergence between Knowledge Management, Communication, and Training/Education and thus are enabled to integrated internal training, with training to customers, partners and resellers though the entire value chain in the new mode of the extended-corporation. Knowledge sharing in organisations is also a very important issue and it has to become smart and fats and e-Learning definitely enables subject matter experts to share their knowledge and create content for the net and create experts/learning communities.
And it is easy to understand how all this translate into competitive advantage, ensuring business growth and time to market responses.

5.4 Technologies, tools and methodology in content creation and delivery

The vision in the education field steer us to think that intelligence will become the buzzword in the future: intelligence in the network, intelligence in objects and in digital elements, which build the technological infrastructure to support content dissemination. Technology is going to be the great potential balance in the socio-economic world of tomorrow as it kills barriers and capital-intensive means of connection, bringing knowledge everywhere and anytime.

Web and internet collaboration tools are in fact ready, learning management systems have developed quite a lot compared to tools and systems available few years ago - they are more than just a click-to-access tools, they help in managing the whole learning process from the organisational and individual perspective.

And the evolutions trend shows that learning will be strengthened by the more available networked technology and by the application of standards to enable cross sharing of content.

More sophisticated technology and live resources completely manageable by learners themselves and by the knowledge suppliers will shift the focus to integrated learning systems, and to the learner who will be given more control on his/her learning experiences.

As a general introduction to the description of tools and systems available to support e-Learning, it is maybe of a general use to give an overview of them based on their functional scope, e.g. from the perspective of the process they address and support. As it is very much important to understand how the tools and systems support the integration of the different learning processes, as shown in the overview figure.

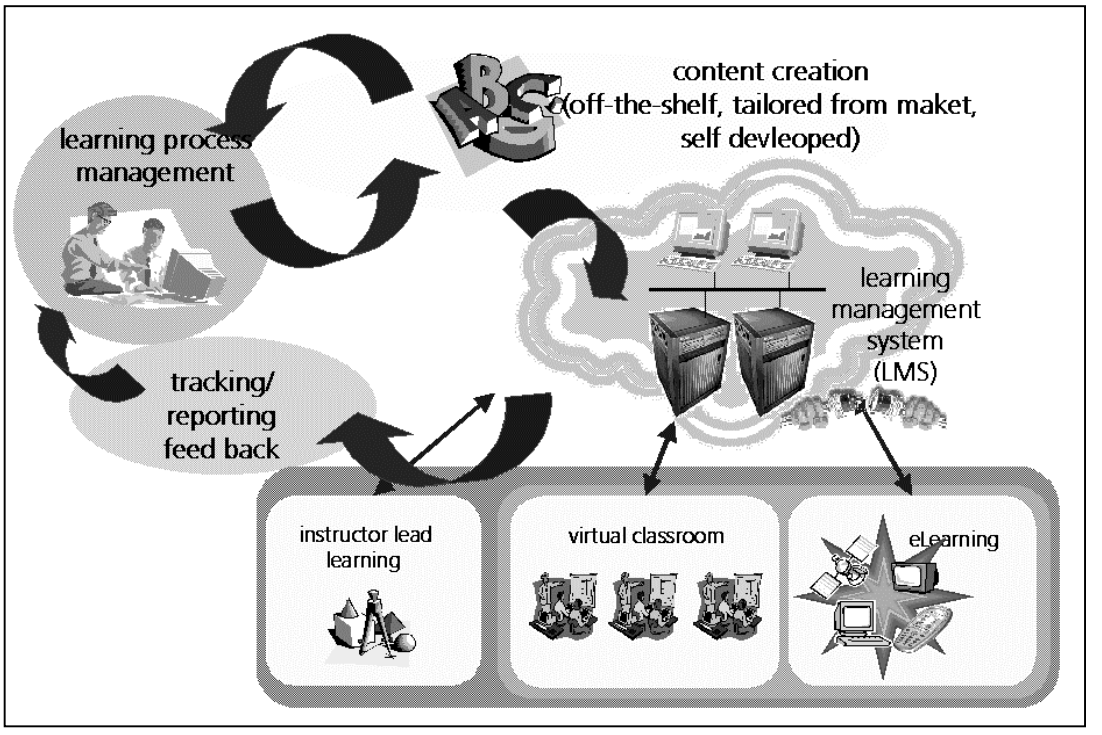


Figure 4: Learning process management

It is also relevant to keep the overall description of available systems and tools very simple, as in the market we are now starting to have quite a lot of commercial products and tools, whose description may require more detailed analysis that is not part of the focus of present white paper.

5.4.1 Distribution, management and delivery

Learning in the digital era can be distributed in multiple ways: via current ISDN fixed lines and broadband technologies, broadcasted via cable TV or satellite TV, channelled via internet/extranet/intranet, or further more, via LAN/WAN networks and finally it can be wireless. The recently developed interoperability capabilities of technology are definitely representing the big step forwards in content distribution potential available in these days.

Management and Delivery of training
One other big important asset, brought into the market by the development of technology, is the highly powerful systems to manage and deliver training and learning, following the process up from early beginning to final phase of it: they are the Learning Management Systems. The Learning Management System (LMS) is a system for both learners and instructors that assist in managing the entire learning process. An LMS takes over time-consuming preparatory and administrative tasks such as publishing content, generating assignments, marking tests, tracking learner progress, producing reports and even tracking

attendance. An LMS also allows instructors to tailor programs. In addition, an LMS can be used to incorporate any type of educational material into a multi-media resource library that can be referenced by learners. Users interact with the system through their own customised portal (user access right enables access), either to plan, organise and develop and manage learning solutions (learning supply view) or to get learning and plain their own development paths (learning view).

Of course the systems features and descriptions maybe definitely more accurate and we could dig into much more details, but in few words the requirements for a good LMS are related to the following main macro areas of functional feature: courses and programs and learning catalogue management, resources management, competency profiling and assessment, enrolment, reporting/tracking and data import/export features, workflow management, commence features, to system security and easy integration to 3rd parties technologies. While from the technical viewpoint good characteristics are related to the type of architecture supporting the systems (n-tier architecture, single- or multi-server installation, etc.), infrastructure (server specs and operating system, databases, etc.), deployment (scalability, links to commercial ERP systems, etc.) customisation and profiling, hosting/housing versatility.

Virtual classrooms

Other tools available in the market to support learning delivery are the Real-time Virtual Classrooms or Collaboration Tools (e.g. live distance learning); they are software products or suites that facilitate the synchronous, real-time delivery of content or interaction by the web. They are systems that facilitate collaboration, people are physically connected at the same time and learning and work together independently on daytime or location. Normally a facilitator or a trainer is present, and he/she is the one who leads the session and transfer the knowledge to the learners. These systems enables video and speech transmission, they also are equipped with feature for document sharing and for live collaboration (online testing, questions and answer in real time, etc.). They start to be a bit of more common usage in big corporations especially because they are perfectly managed, tracked and integrated into the above-mentioned Learning Management Systems, which support management of any type of learning delivery and channel.

In the world of e, it is somehow strange to mention, but worth too: by delivery we still refer to content transfer in the so-called traditional way, the classrooms training. The classrooms training can be again easily be planned, tracked and managed by the Learning Management Systems, so all information relevant to training and learning are gather and tracked in a consistent and digitised way as well as stored in common data bases. Expert are in fact more and more discussing about integrated learning solutions, where the classroom solutions get integrated and get power and enrichment by multimedia and e-driven learning solutions.

6. Best Practice Applications

Best practice applications can be found in the different market segments: consumer, business, academic, and public sector.

6.1 B2B Business-to-Business

This segment addresses the public administration in general, universities and training institutes and small/medium enterprises.

The Companies increasingly reveal a pressing need to train and develop own resources and employees to enter the Net Economy, to be able to maintain own success position in the market or to re-position or reengineer with right competences to face the challenging new market.

Training and learning must be therefore of quality, with high technological content, strategically aligned with market directions and easily deliverable time- and cost-wise. In particular, compared to big corporations, small and medium companies represent an interesting segment to penetrate as the need to keep up with market trend and development is in many cases a source of success if not survival.

Public Administrations and the public sector in general are as well widely facing a deep renewal process of their own internal operational procedures, technological infrastructures as well of the professional skills as well the managerial competencies of their middle and top executive layers.

Finally the world of Universities, Schools and Educational Institutions offers to many business opportunities within the scope of special projects for advanced training, like as an example cooperation's with compulsory schools, universities, institutes for disabled persons, etc. The digital world of learning impacts the world of trainers, teachers and professors too. In few researches carried out among professionals in the training and education field both in the public and private sector, e-Learning competences of teachers and trainers have been estimated insufficient or hardly in line with the real needs.

Therefore it is extremely evident the need for teachers, professors and trainers and pedagogical professionals to get rained in the world e-Learning (skills, competences, pedagogical approach, instructional design, technology, delivery methodology, facilitation, etc.).

Furthermore educational landscape is somehow changing in the last years, continuously under discussion is the decaying buildings and system of compulsory education, systems and programs adopted are being renewed and reshaped, critical shortage of teachers and professors is another issue governments are facing to solve, and the increase of more and more demand for high quality standards in education.

For all the above shortly described reasons the three different segments are important one to focus and pay attention to. e-Learning is definitely an answer to the above identified needs in terms of rapidity in response, quality in results, efficiency in implementing the solutions, etc.

6.2 B2C Business-to-Consumer/Citizen

Consumers, citizen and families in general, present a growing segment.

Lifelong learners are those people, who in the consumer market are pursuing learning opportunities either related to their own personal hobbies and interests. They most probably already searching and surfing the net. So even more probably they will turn to more formal learning experience when structure, well-shaped and sophisticated learning solutions will be offered via the net.

There are also people who independently wish to further strengthen their professional competences because this is part of their own wish to strengthen and diversify their professional and job related competence. However there are also other individuals in the market, who have specific professional profiles, such as lawyers, physicians, dentists, etc., who needs not only to continue to increase job related skills but in a wider sense their education. Many of these professionals are mainly responsible to take care of searching, buying and paying for their own development, as they may not be employed by any corporations.

e-Learning offers definitely the opportunity to bring learning to the “learners”, to the individuals in a flexible way defying all the constraints coming from time, geography, location and it offers direct connection to content and knowledge that it was maybe difficult to ensure few years ago.

6.3 Best practice: Example for B2B Project of comunicando società per azioni

The case here below is a case, which describe the Business-to-Business model which comunicando società per azioni is pursuing as per of its strategy.

Figure 5: Logo of comunicando società per azioni

It is a prospect case still under non-disclosure but it is here proposed to give some visibility of possible business models to support further thinking around the business-to-business customer target.

The case here is about an university which since few years offers post-graduate course to newly graduates students as well to professionals who wish to further deepen their specific competence in the given subject matters.

6.3.1 Major aims

Two are the main aims of the organisation.

One is to offer, additionally to the traditional in-site classroom courses, learning content available on the net by utilising e-Learning technology and methodology. This in order to enrich the service offered to students who can already participate to classroom courses as to improve flexibility in content accessibility, further deepening of topics, and collaborative opportunities on top of the traditional learning opportunities.

Second aim to of course to reach those students who, by different reasons, such as geographical distance, full time employment engagement, other issues which my partially or totally hindering their participation to is learning offering.

In few words, its overall target is to both increase richness and reach of its learning supply for the Italian market.

The idea is to reproduce on the line the campus environment by making all the main functionalities to manage and deliver the programs available on line and truly enabled by e-technology.

Key issue is focusing in enabling all the players in the campus – directors of the programs, professors and mentors, secretarial office and students – to access specified functionalities in the systems to perform their roles to the final goal of making programs successfully delivering content and competence improvement.

6.3.2 Managing Learning Content

The business model is made up by two main components: developing, integrating and implementing the learning solutions management platform as well as creating and developing e-Learning content modules.

The management platform is a system, which enables learning processes management, automation, content creation, virtual collaborative learning management, and creation of learning communities, testing, tracking and reporting.

Many of the management processes get streamlined and are made automated and therefore more efficient by use of technology. Moreover content created and made accessible

through the platform is reusable, easy to be updated, then integrated to other learning off-line and live resources to enrich the studying opportunities. It is easer to avoid content and know-how dispersion as knowledge is digitised, stored and kept for further development and represents the true intellectual capital made available to current and future learners and the organisation itself.

In a summarised overview, functionalities are related to content creation, testing and assessment, collaborative activities, learning process management.

6.3.3 Creation of Learning Content

Content creation is made according to main international standards as to allow integration, reusability technical sharing of content dissemination. Content can be created in house or imported from 3rd partied creation sources and can be created under shape of complex programs (executable files, audio and video streaming, animated and interactive products, etc.) or simple use of main electronic format of common use (gif, power point, word, excel, acrobat, HTML, etc.).

Testing and assessment
Testing and assessment are also crated or imported to the system according to international standards. They are linked to specified content and can created according to different types of needs: multiple choices, single answer, fee text, question & answers, true/false answers, with reply feed back, etc. They can be used to get the students ready for examinations as well as for real examination testing and results can be stored in the score register for curricula completion.

E-Learning as collaborative approach
Collaborative environment is extremely important in the learning process, as it is pretty renowned that people retain the most by taking active and proactive role in the studying activities. The system allows real time chat (synchronous environment) amongst different players in the learning scenario – content is the indexed and made available for further use and review to integrate formal training activities with informal but as much valuable knowledge. Mail and discussion groups are the other asynchronous modes to interact among each other while learning, as to share doubts, get clarifications, share opinions, etc. discussion may be organised by defined themes (threaded discussion) and the can be moderated by experts and mentors as to add proved value from the teaching perspective.

Training process management
The automation of training process management is another key added value brought by the platform to increase efficiency and cost monitoring to the organisation. It makes the course organisation, scheduling and planning easy and immediate and quick. Automatic enrolment contributes to facilitate the administration process. Content creation, definition, description and publishing to an online catalogue are also possible and give a greet deal of flexibility in communication and information sharing across the students communities. Collaboration activities are also managed thought he platform and therefore facilitated in their launch, management and monitoring. As said already, the system enables testing and

score register creation, maintenance and wrap up for single students and/or classes. Students can also access their own test results and scores. Reporting and tracking feature is also a very good improvement brought into use as it facilitate analysis, course navigation, students preference tracking, and it provides valuable information about the courses to produce further improvement and quality to the learning offering and supply.

Roles in the campus
As mentioned above: directors of the programs, professors and mentors, secretarial office and students – get access right (via user name and password allocation) according the defined profile as to access functionalities described above to let them carry out their activities. Some roles may have full access rights and perform the totality of the operations, or they can be restricted according to need, or they can be "read only" access as not to allow the interactive or collaborative activities. Profiles can be defined as to allow any possible flexibility according to the organisational needs of the organisation.

The business model proposed is based on a system-hosting proposal. The below scheme describes in brief the proposed approach.

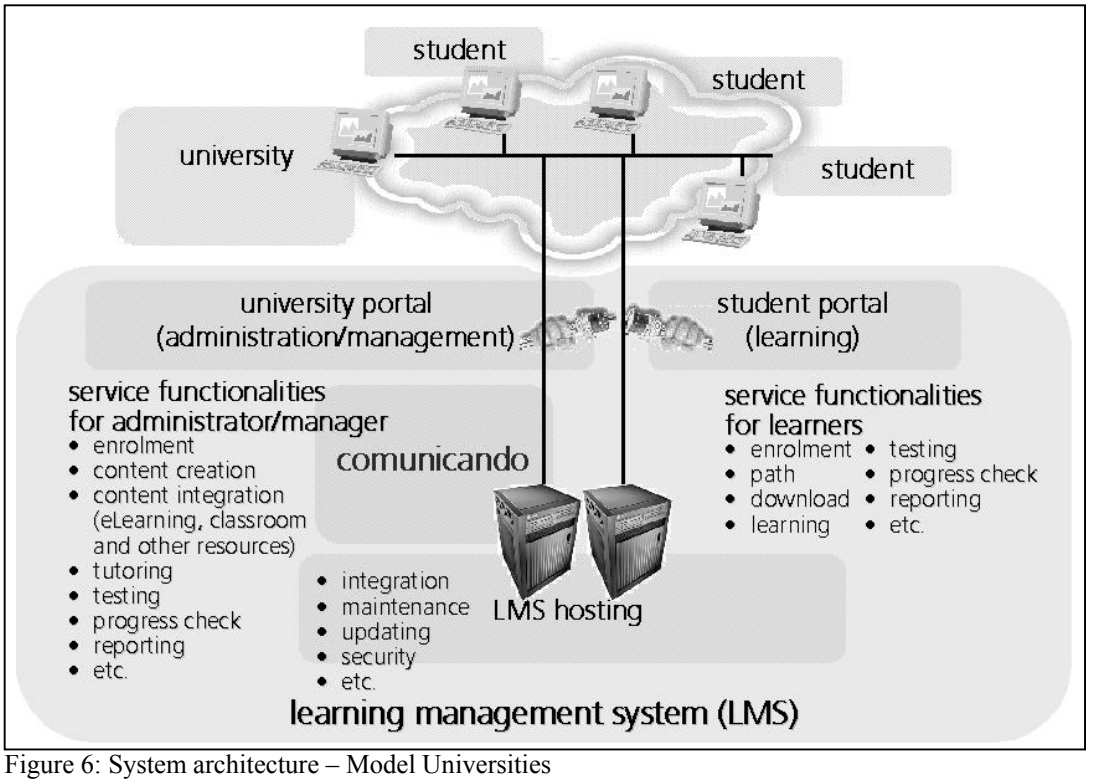


Figure 6: System architecture – Model Universities

The learning management platform is hosted by comunicando società per azioni in its technological infrastructure.

This lets the customer be focused on it core competence, which are represented by know-how ownership and value in content design and creation, assessment and verification, mentoring and facilitation in learning. The customer does not get the burden on big technological investments as well as does not need to worry about system redundancy, server duplication, maintenance, release update, security controls, etc. The needed application for the customer, on client based approach, would only be a common browsing tool installed on the users terminal (personal computer) to access the system ad perform activities according to users rights. The revenue model is based on a pay per user access right.

Two are the main access channels to the system and to functionalities: portal for the university (administration and management functions) and portal for the students (learning related functionalities). Via these portals the players can log into the systems and exploit the platform functionalities to manage the activities their role is enables to. This offers a personalised look and feel channel, which facilitates the navigation activities into the system features.

Learning Modules Development

Here a brief view is given about learning modules development. Content modules creation aims to reproduce the live lesson by a multimedia integration of written material as well as possibly synchronised to audio and video resources or not, depending on the complexity the customer want to give to the products to be offered on line. The learning process is facilitated by an interactive table of content, which enables the student to focus on the part of interest enabling a quick and easy navigation, letting the student get back and forth though the different topics available. An interactive control panel allows the students to play the content, to be back, to go forward, to stop and to bookmark the level of learning achievement. The product can be enriched by other resources such as glossary, bibliographies, FAQ, etc. as well as testing – described above – linked to the content for assessments and evaluation of learning progress.

The customer disposes of already existing audio and material, which can be revaluated from a multimedia e-Learning approach and made it available on line for long lasting usage and intellectual capitalisation of in-house knowledge. Video can be taken live during lessons and re-worked from a technical viewpoint and integrated to synchronised material to produce the online learning module.

Modules can be very basic as well as very complex and interactive according to need.
This business model is very much applicable in case of small and medium enterprises and Public Administration as with regard to level of investment resources availability, which are not necessarily all the time up to the capacity of small organisation units tough they still would like to put a heavy focus on training efficiency their own recourses and personnel.

The content creation approach is also very well applicable as it mainly aims to the revival of existing knowledge in the organisation and its transformation to a digitised content for further reusability and dissemination as not to loose precious intellectual richness. A

particular value may be offered by this approach to public administrations, which, by historical and organisational reasons, normally own a great deal of internal information and content distributed in the different organisational layers, which in many cases is not fully used and shared across the organisation.

6.4 Best Practice: Example for B2C Project of comunicando società per azioni

The case here below is a case, which describe the Business to Consumer model. This is as well part of comunicando società per azioni main strategic focus, as the company really aims to target the consumer market by making e-Learning available to individuals seamlessly independently on the access terminal at their disposal: TV set, mobile devices, PC screens, 3rd generation technology, etc.

Mobile learning is a killer application to make e-Learning ready for next generation waves.

6.4.1 E-Learning platform

Main backbone of the model is, as described in the case above, the learning solutions platform and all the functionality description provided earlier on are key to the proposal here too.

Roles may be changing and therefore access rights to functionalities will be coded accordingly.

Main players here become the individuals, who access the content seamlessly from home, on the move, etc; content creators, which offers their content available to bigger consumer audience; comunicando società per azioni, which plays the role of hosting unit as well as main administrator and dispatcher of content to consumer.

The proposed system architecture is briefly described in the following figure.

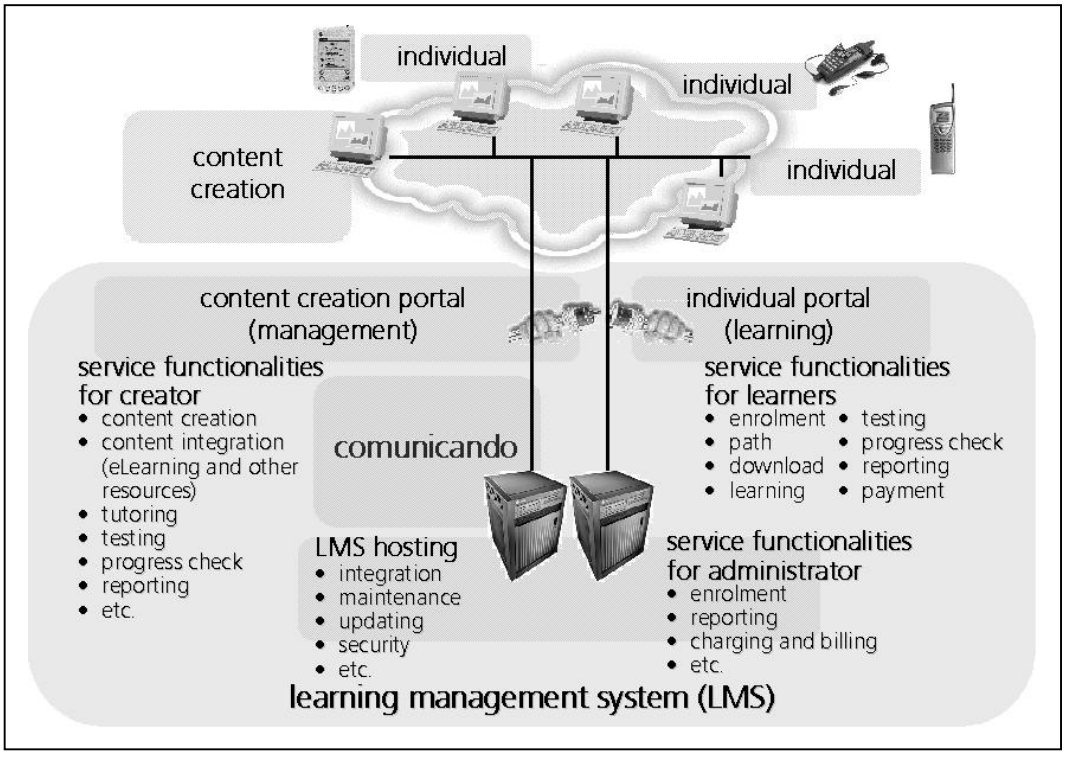


Figure 7: System architecture – Model Consumer

Pricing model is a consumer model – low price, good quality which foster the reiteration to access to other content because the experience is good, is amusing, is nice, looks good - her we introduce the concept of edutainment and gaming approach applied to learning.

Easy access via portals to facilitate navigation, collaborative environments, chat and discussion forums are enriching the proposed supply. Download and offline access and reload for learner history and progress update are as well key futures to this model.

Access to e-Learning platforms
In this model of course technological backbone plays a key role as well applications enabling access to any kind of terminal and device is important, however access to content is becoming real cornerstone. As many different type of content maybe channelled and offered to the vast consumer target groups, clustered by interest areas, topics and themes and community (children, elders, housewives, musicians, lawyers, environment associations, etc.).

Thematic offering available online and accessible anytime, anywhere is fundamental as it may answer to many of the consumer needs.

From professional skills development viewpoint, it represents offering to those who wish to deepen competencies for career and vocational training.

But it also represents a huge offering opportunity to those who wish to pursue personal interests and hobbies development, form music to literature, from cultural journey about architecture and painting to any other cultural aspect, form cooking to photography, from cards playing to origami, from environmental education to civic etiquette of behaviour, etc.

Special boost of ethical improvement for the community development is given by the opportunity that this model may offer to bring access to content easily at home of disable people and to those who may have difficulties in participating to “traditional” knowledge sharing session.

Of course learning for disabled people, especially for heavy and serious problems, would deserve a longer and more dedicated context for discussion, especially from instructional viewpoint, which is not within scope of this dissertation. It is pretty much clear the huge benefit opportunity that e-Learning brings this important area of education.

7. Outlook

7.1 Need for a strategy

It is import that the organisation has a learning and training vision and strategy that steer the direction towards targeted results. We need to be clear about the organisation business objectives and how the training strategy can support and enable them.

It is of outmost important to understand what is the current training strategy (stage of execution, degree of awareness on the organisation and in the management layers, etc.). In a good strategic planning exercise identifying the key stakeholders to support the strategy is very important: you may have organisational, technological and individual stakeholder, who by job role, competencies or mind set attitude may determine the success or failure of the strategy as well as of the implementation of plans.

Another important step while developing the strategy is the deep analysis of the key critical strategic issues and success factors they need all the time to be monitored and kept under due control as they may be the turning point for a success or a flop.

Finally mapping of the next steps to reach the strategic outcomes completes the planning phases: here macro directions and key-milestones are indicated and they must be in line with the organisation business targets. They normally lead the path for the more detailed strategy implementation plans.

7.2 From strategy to implementation

Once the strategy is ready and communicated and the business case is very well known in the organisation as well as it is perceived as supporting the overall business objectives, the time has come to move to implementation plans.

First actions are related to the project team creation and to the communication plan preparation: especially to support high lobbying in the management layers as well to educate the organisation about e-Learning benefits.

Second main step is to analyse the training management process and set all requirements that need to be matched by the solutions and systems to be purchased. Vendors' selection, technology assessment and bid to the vendors come next. If the organisation is very big, the next suggested step is related to the project pilot definition (geo area, department, etc.) where to run the first trial before the roll out of the system to entire organisation.

If you also need to develop and/or buy content, it is important to carry out a need analysis to define what content goes "e" and for which target group of employees. In case the content will be developed externally, vendors' selection, demo assessment and technology check if the packaging is standard compliant and fits into the other infrastructure is vital. Content migration to the new systems and database will come as one of the immediate

steps. Other subsequent activities are linked to the integration of the new e-Learning project with other existing learning supply and to a proper marketing of the projects according to communication plan already defined.
Bleu printing and good documentation of each phase is very beneficial to manage project and to refer back when the system will go-live.

7.3 Change management

Change management is definitely one of the most challenging phases of an e-Learning project as the latter is impacting on processes, on people and on learning culture habit. Communication to managers, trainers and employees and individuals in general is fundamental: you need to explain how their learning changes, how their daily life gets enhanced and improved by the support of the technology, show them how the system works, do E-Learning with them, support the organisation to create discipline to facilitate the new way of learning (time for learning, respect for learning, rewarding for learning…).

Glossary

ADL (Advanced Distributed Learning)	ADL is an initiative by the U.S. Department of Defence to achieve interoperability across computer and Internet-based learning courseware through the development of a common technical framework, which contains content in the form of reusable learning objects.
Associative Access	Knowledge retrieval based on pattern matching between an unstructured query (text paragraph) and a document content store.
Authoring tools	Tools/SW to create and adapt content to the web for use in an online course. They assist in creating e-learning solutions and provide a "do-it-yourself" option for placing content and materials online.
Categorization / Category	Assigning documents to different groups by performing content-related analysis - so called categories. Categorization schemes are typically built upon business processes and business rules or rely on knowledge domains within an organisation.
CD-ROM assessment	An assessment or survey that can be accessed and completed by using a CD-ROM launched through a company's intranet. CD-ROM based assessments also can be used on a desktop stand-alone computer if the assessment is a self-assessment for the benefit of the trainee only. Alternatively, a CD-ROM-based survey can be printed (if the CD-ROM has a print capability) and used as a paper-based survey.
Computer-based training	A term used to describe any computer-delivered training, including CD-ROM, the Internet and Intranets. Sometimes referred to as Computer-assisted instruction (CAI), CBT is asynchronous learning.
Classification / Class	Collection of methods applied to categorize documents by analysing their content. In many cases, categories and classes are identical. Categories incorporate the semantics of the application, whereas classes may also be of formal nature.
Classify	Classification is a method of assigning retention/disposition rules to records. Similar to the Declare function, this can be a completely manual process or process-driven, depending on the particular implementation. As a minimum, the user can be presented with a list of allowable file codes from a drop-down list (manual classification). Ideally, the desktop process/application can automate classification by triggering a file code selection from a property or characteristic of the process/application.
Content Search	Information retrieval based on pattern matching between a query (text paragraph) and a document repository.
Distance learning/ Interactive Distance Learning (IDL)	Traditionally refers to a broadcast of a lecture to distant locations, usually through video presentations. IDL is a real-time learning session where people in different locations can communicate with each other. Videoconferencing, audio conferencing or any live computer conferencing (e.g., chat rooms) are all examples of IDL.
Document	A document (any form or format), an email message or attachment, a document created within a desktop application such as MS Word, regardless of format. There are two forms of document: Electronic Document: Body (text) of the document is stored in electronic format and can be read. If declared as a record, an electronic document becomes a managed record (i.e. a document may or may not be a (declared) record) Non-Electronic Document (Ndoc): A physical document of any form (maps, paper, VHS video tapes, etc.). Body is not recorded in electronic form, but descriptive metadata is stored and tracked within CM (profile). If declared as a record, an Ndoc becomes a managed record (i.e. an Ndoc may or may not be a (declared) record).
Document Life Cycle Management	The records life cycle is the life span of a record from its creation or receipt to its final disposition. It is usually described in three stages: creation, maintenance and use, and final disposition. e-Records applies management to all three stages. With e-Records, the records manager can create and maintain the official rules that will dictate when to destroy (or permanently keep) electronic records, as well as record

	and enforce any conditions that apply to destruction (e.g. destroy 2 years following contract completion). Finally, the records manager can carry out the physical destruction of electronic records, maintaining a legal audit file.
Document Security Control	Access control to documents (non-declared records) Note: Document security control is different from Records Security Control.
Electronic Recordkeeping	The practice of applying formal corporate recordkeeping practices and methods to electronic documents (records).
Electronic Signature	A signature is a bit string that indicates whether or not certain terms occur in a document.
Enterprise Content Management	Manage all content (i.e. unstructured information) relevant to the organisation. It embraces three historically separate technologies: web content management, document management, and digital media asset management. While outwardly dissimilar, all of these forms of enterprise content share similar needs for mass storage, search and access, personalisation, integration with legacy applications, access and version control, and rapid delivery over the internet.
EPSS (electronic program support system)	An electronic system that provides integrated, on-demand access to information, advice, learning experiences and tools. In essence, the computer is providing coaching support (i.e. the principal of technology based knowledge management).
File	A disk “file”, something stored on electronic media, of any file. Does not necessarily denote a record. For example, “image files are stored an a server” simply refers to the electronic images, and implies nothing about the records status. Will be used in the context of describing the storage of documents and related information to electronic media.
File Plan Administration	Design and administration of the corporate file plan. The records manager can design file plan components. With Tarian’s file plan designer, the records manager can design classes of file plan objects (files, records, folders, etc), then define the attributes of these classes. Relationships between classes are then defined (i.e. files can contain files, records and folders). Various views of the file plan may be defined. For instance, a warehouse view might present a view of the physical folders in the organisation, whereas a numeric view might present the sorted numeric structure for maintenance purposes. The records manager can create pick-lists enforcing consistency within the file plan, component profiles that define the characteristics of the file plan, and default values to simplify daily file creation tasks. Policies, Permissions, and Suspensions may be assigned to file plan objects.
Information mining	Linguistic services to find hidden information in text documents on content servers
Information Retrieval	An information retrieval (IR) system informs on the existence (or non-existence) and origins of documents relating to the user’s query. It does not inform (i.e. change the knowledge of) the user on the subject of his inquiry. This specifically excludes Question.
Keyword Search	Information retrieval method based on literal match of words.
Learning Resource interchange (LRN)	LRN is the Microsoft implementation of the IMS Content Packaging Specification. It consists of an XML-based schema and an LRN toolkit. It enables a standard method of description of content, making it easier to create, reuse and customise content objects with an XML editor, whether initially developed from scratch or bought under license from vendors.
Neural Networks	In information technology, a neural network is a system of programs and data structures that approximates the operation of the human brain. Typically, a neural network is initially "trained" or fed large amounts of data. A program can then tell the network how to behave in response to an external stimulus (for example, to classify a document based on its content).
Pattern Matching/ Recognition	Matching/Recognition of objects based on features. Pattern Matching with regard to text documents means to identify and match words and phrases from different documents under the assumption that the more features match, the more similar the contents are.
Personalisation	The ability to provide the user with the right content both from the user's and Web

	site owner's perspective. A personalisation algorithm determines whether content is presented to the user, and if so, in what order of priority.
Portal	A single integrated point of comprehensive, ubiquitous, and useful access to information (data), applications, and people.
Record	Any form of recorded information that is under records management control. Records are either Physical or Electronic. Records may take any of the following four forms: Document: A document (see above) that has been declared as a record. Once declared as a record, the document is under records management control Folder: A folder of (paper) documents. Individual documents within the folder may or may not be treated as records (declared Ndocs). The physical handling of the folder is managed by Tarian's Physical Records Module Box: A box of (typically) paper documents. Usually contains folders (see above), which are individually managed as records, but may alternatively contain records other than folders such as loose documents of a given subject. The physical handling of the box is managed by Tarian's Physical Records Module Ndoc: A declared Ndoc (See above for definition of Ndoc) Important: A document (electronic or Ndoc) will not be considered to be a record until has been declared.
Record, Electronic	Electronic Records (e-Records). Any information (document) recorded in electronic form, on any digital media, that has been Declared to be a record. Characteristics of an e-Record: Document is in electronic form Metadata is associated with the document Document has been classified against a file plan Only the authorised Records manager has the means by which to apply retention/disposition to the document.
Record, Physical	Folders, Boxes, Ndocs to which records management control has been applied. A document (electronic or Ndoc) becomes an e-Record only once it has been declared.
Records Administration	The administrative infrastructure represents the tasks that the records manager carries out on the entire organisation's collection of declared records. Conducted within Tarian's Records Administration Client, a browser-based web application. End users never see this process. Consists of the following four broad activities; File Plan Administration, Records Security Control, LifeCycle Management, and Reporting.
Records Manager	Conducts one or more records administrative functions.
Records Security Control	Access control to declared records. Users and Groups of users may be created, and assigned roles and policies that will interact to determine the records users are able to access. Note: Records security control is different from Document Security Control.
Reporting	The process of generating reports from data managed by eRecords solution. It is a tow-step process. Reports are first designed, and the design is saved for later reuse. Second, reports are generated by running the report design against the data.
Repository	Physical storage are for documents and/or electronic records.
Retention Rules	(Retention Schedule). The set of rules which specify how long to keep (retention) records, and what to do with them at the end of their lifecycle (disposition).
Syntactical Analysis	Syntactical analysis derives the syntactic category of words or phrases based on (language dependent) dictionaries and grammars. Example: house – noun.
Thesaurus	A book that lists words in groups of synonyms and related concepts.
Volume	Folder. A Volume will be referred to as a folder (common US terminology).
Virtual Reality (VR)	Virtual Reality simulations (usually involving wearing headgear and electronic gloves) that immerse users in a simulated reality that gives the sensation of being in a three-dimensional world.

Abbreviations

ASP	Application Service Provider
AVI	Audio Video Interleaving
BCR	Bar Coding
BPM	Business Process Management
CBT	Computer Based Training
CCD	Charge Couple Devices
CM	Content Management
COLD	Computer Output to Laser Disk
COM	Component Object Model
COOL	Computer Output On Line
DBMS	Database Management System
DMS	Document Management System
DRT	Document Related Technologies
ECM	Enterprise Content Management
E-Learning	Education, training and structured information delivered electronically
ERM	Enterprise Report Management
ERP	Enterprise Resource Planning
E-Term	European programme for Training in Electronic Records Management
FDDI	Fibre Distributed Data Interface
GIF	Graphic Interchange Format
HTML	Hypertext Mark-up Language
ICR	Intelligent Character Recognition
ICT	Information and Communication Technology
IDM	Integrated Document Management
ISDN	Integrated Services Digital Network
ISO	International Standards Organisation
JPEG	Joint Photographic Experts Group
KM	Knowledge Management
LAN	Local Area Network
LDAP	Lightweight Directory Access Protocol
MoReq	Model Requirements for the management of electronic records
MPEG	Moving Pictures Expert Group
NAS	Network Attached Storage
OCR	Optical Character Recognition
ODCB	Open Database Connectivity
OLE	Object Linking & Embedding
OMR	Optical Mark Recognition
PDF	Portable Document Format
PPP	Point-to-Point Protocol
RMS	Records Management System
RTF	Rich Text Format
SAN	Storage Area Networks
SQL	Structured Query Language
TCP/IP	Transmission Control Protocol/Internet Protocol
TIFF	Tag Image File Format
WAN	Wide Area Network
WAV	Audio Format File
WCM	Web Content Management
WebDAV	Web-based Distributed Authoring & Versioning
WORM	Right once read many times
XML	eXtensible Mark-up Language

References

International Council on Archives	Guide for managing electronic records from an archival perspective Paris, 1997
Sarah Tyacke	E-government and archives: issues and impacts
Caroline Williams (ed.)	Archives in the UK and the Government Agenda Liverpool University Centre for Archive Studies [LUCAS] 2002
Heather MacNeil	An excellent discussion of the importance of the reliability and authenticity of electronic records is provided in: Trusting Records: Legal, Historical and Diplomatic Perspectives Dordrecht, Kluwer Academic Publishers, 2000
David Bearman	Electronic Evidence: Strategies for Managing Records in Contemporary Organisations Pittsburgh, Archives and Museum Informatics, 1997
E-Term	http://www.ucl/ac/uk/e-term/
Charles M. Dollar	Authentic Electronic Records: Strategies for Long-Term Access Chicago, Cohasset, 2000
Elizabeth Parker	Managing your Organisation's Records London, Library Association, 1999
UNESCO	Discussion Papers on digital archives and records http://www.unesco.org
Editors:	
Yola de Lusenet	European Commission on Preservation and Access
Professor John McIlwaine	Emeritus Professor of Oriental and African Bibliography, School of Library, Archive and Information Studies, UCL,
Charles Dollar	Authentic Electronic Records
Open University UK	http://www.open.ac.uk/courses/ODE/

Universities of Oxford (UK), Stanford and Yale (USA)	http://www.allianceforlifelonglearning.org
Laurel Alexander	Education and Training on the Internet
SRI Consulting and WR Hambrecht + CO	What is driving e-Learning?
Federcomin, Anasin, IDC 2000	Lack in competence and skills
Financial Times	Lack of ICT training of school professors March 12th, 2002
comunicando società per azioni	e-Learning infrastructure
comunicando società per azioni	Definitionof e-Learning
comunicando società per azioni	System architecture – Model Universities
comunicando società per azioni	System architecture – Model Consumer
Laurel Alexander	Education and Training on the Internet www.internet-handbooks.co.uk, 2000

Authoring Companies

TRW Systems Europe

TRW Systems Europe is a leading business and technology integrator - providing total web and customer-centric supply chain solutions that help global companies, in a wide range of industry sectors, rapidly re-engineer their business processes and operations. For chosen vertical markets: TRW Systems Europe manages people, processes and technologies more effectively and more imaginatively to deliver and support timely, on-budget solutions over the whole lifecycle of complex projects.

As well as domain expertise in: Defence & Intelligence, Civil Government, Public Safety, Enterprise Services (e-business), Biometrics (NAFIS) and International Organisations; TRW System Europe serves a broad range of industrial manufacturing organisations, in the automotive, electronics, consumer goods, medical, food and beverage, and third-party logistics sectors; with flexible solutions to cover their entire IT requirement from ERP, supply chain management and logistics to e-commerce, collaborative product development and advanced planning & scheduling.

We build agile business systems that seamlessly integrate all manufacturing operations and help transform these companies into e-manufacturing organisations. TRW Systems is part of TRW Inc, who provide advanced-technology products and services for the aerospace, information systems, and automotive markets. The company, which has celebrated its 100th year of operation during 2001, had year-end sales of $16.4 billion.

For more information please visit www.trw.com.

Contact Authoring Company

TRW Systems Europe
Wolfgang Sommerer
Seidengasse 33/35 - Top 13
A - 1070 Vienna - Austria
Tel : + 43 (0) 1 522 70 27 0
E-Mail: Wolfgang.Sommerer@trw.at

UCL University College London

University College London was founded in 1826 and first opened to students in 1828. The university has been a distinguished pioneer of new ideas and new methods in teaching and in research throughout its existence.

It is committed to maintaining its liberal tradition, both in terms of access to higher education and the continual evolution of its curriculum to meet the demands of tomorrow.

For further information see: www.ucl.ac.uk.

Contact Authoring Company

UCL University College London
Elizabeth Danbury
Gower Street, London WC1E 6BT - UK
Tel: +44 (0) 20 7679 7204
E-Mail: uczceda@ucl.ac.uk

comunicando societa' per azioni

comunicando aims to be the reference company for added value services in the mediterranean area thanks to its competencies in the telecommunication infrastructures, terminals and applications fields.

comunicando devotes a special focus of its e-learning strategic objectives to the mobile and wireless e-learning applications, which support learning and edutainment on the move and which represent an interesting field for innovative and creative technological products and solutions.

comunicando concentrates its research, innovative pilots and production on creative and innovative applications development for most commercial wireless terminals available in the market and offers full learning solutions including hosting.

For more information please visit www.comunicandospa.com

Contact Authoring Company

comunicando societa' per azioni
michele boccaccio
corso italia, 172
95100 Catania - Italia
tel. : +39 (0)932 803613
e-mail: servizi@comunicandospa.com

Industry White Paper Series on Records, Document and Enterprise Content Management for the Public Sector

Capture, Indexing & Auto-Categorization
Intelligent methods for the acquisition and retrieval of information stored in digital archives
ISBN 3-936534-01-2

Hewlett-Packard GmbH
Conversion & Document Formats
Backfile conversion and format issues for information stored in digital archives
ISBN 3-936534-02-0

FileNET Corporation
Content Management
Managing the Lifecycle of Information
ISBN 3-936534-03-9

IBM
Access & Protection
Managing Open Access & Information Protection
ISBN 3-936534-04-7

Kodak
Availability & Preservation
Long-term Availability & Preservation of digital information
ISBN 3-936534-05-5

TRW Systems Europe / UCL - University College London / comunicando spa
Education, Training & Operation
From the Traditional Archivist to the Information Manager
ISBN 3-936534-07-1

Publishing Information

The series of six Industry White Papers is published to address the needs of public administration and archives at the European, national, federal and local level and to educate the public sector throughout Europe about available solutions for archival problems on relevant topics about acquisition, management, long term storage, multilingual access, indexing and training issues.

DLM-Forum
The current DLM acronym stands for *Données Lisibles par Machine* (Machine Readable Data). It is proposed that after the DLM-Forum 2002 in Barcelona this definition be broadened to embrace the complete "**D**ocument **L**ifecycle **M**anagement". The DLM-Forum is based on the conclusions of the Council of the European Union, concerning greater co-operation in the field of archives (17 June 1994). The DLM-Forum 2002 in Barcelona will be the third multidisciplinary European DLM-Forum on electronic records to be organised. It will build on the challenge that the second DLM-Forum in 1999 issued to the ICT (Information, Communications & Technology) industry to identify and provide practical solutions for electronic document and records management The task of safeguarding and ensuring the continued accessibility of the European archival heritage in the context of the Information Society is the primary concern of the DLM-Forum on Electronic Records. The DLM-Forum asks industry to actively participate in the multidisciplinary effort aimed at safeguarding and rendering accessible archives as the memory of the Information Society and to improve and develop products to this end in collaboration with the users.

European Commission SG.B.3
Office JECL 3/36, Rue de la Loi 200, B-1049 Brussels, Belgium
A/e: dlm-forum@cec.eu.int

AIIM International - The Enterprise Content Management Association
AIIM International is the leading global industry association that connects the communities of users and suppliers of Enterprise Content Management. A neutral and unbiased source of information, AIIM International produces educational, solution-oriented events and conferences, provides up-to-the-minute industry information through publications and its industry web portal, and is an ANSI/ISO-accredited standards developer.
AIIM Europe is member of the DLM-Monitoring Committee and co-ordinates the activities of the DLM/ICT-Working Group.

AIIM International, Europe
Chappell House, The Green, Datchet, Berkshire SL3 9EH, UK
http://www.aiim.org

Industry White Paper Series on Records, Document and Enterprise Content Management for the Public Sector

The Industry White Papers are published by the DLM-Forum of the European Commission and AIIM International Europe to address the needs of public administration and archives at the European, national, federal and local level and to educate the public sector throughout Europe about available solutions for archival problems on relevant topics about acquisition, management, long term storage, multilingual access, indexing and training issues. The leading suppliers of Enterprise Content Management technologies participate in this series and focus on electronic archival, document management and records management for the public sector in the European Community.

Education, Training & Operation

This White Paper looks at the management of electronic archives. It analyses education and training requirements in the digital world, looking at the drivers to e-Learning and the learning gap. It considers the challenges faced by universities, some of the new pedagogic methods under development and the new possibilities for continuing professional development and lifelong learning. It outlines the different business models illustrated with examples of best practice and argues that businesses and institutions in the 21st century must have and implement a learning and training vision.

ISBN 3-936534-00-4 (Series)
ISBN 3-936534-07-1